Claims

1. Device for exchange of moisture, between at least two counter-current gas flows (A, B), comprising a generally closed chamber (1, 101) having an inlet (7, 107) and an outlet (8, 108) for a first gas flow (B), such that the first gas flow flows in a first direction from the inlet to the outlet inside the chamber; and at least one duct (2, 102), which extends inside the chamber, generally in parallel with the first direction, which duct (2, 102) is arranged to conduct a second fluid flow (A) in an opposite direction to the first direction and which duct (2, 102) comprises a duct wall material with high permeability to water , **characterized by** an inlet space for the gas flow B, which inlet space is arranged in the central chamber (1, 101), between the inlet (7, 107) and a first support and flow distributing member (9a, 109a) arranged inside the chamber (1, 101) between the inlet opening (7, 107) and the outlet opening (8, 108), and having an extension in a plane which is non-parallel to the first direction, such that it extends over the essentially entire area of said plane inside the chamber, which support and flow distributing member comprises at least one duct opening (10, 110) through which the at least one duct (2, 102) extends and a set (11a, 11c, 111) of flow distributing openings, and by means for uniform distribution of the gas inside the inlet space for providing a generally parallel and uniform first fluid flow (B) inside the chamber.

2. Device according to claim 1, wherein said set (11a, 11c) of flow distributing openings is arranged such that the sizes of the openings (11a', 11a", 11c', 11c") vary over the area of the support and flow distributing member (9a, 9c).

3. Device according to claim 1, wherein said set of flow distributing openings is arranged such that the number of openings (11a'", 11c'") per area varies over the area of the support and flow distributing member (9a, 9c).

4. Device according to any of claim 1 to3, wherein the chamber (1) is defined by a number of side walls (1a, 1b, 1c, 1d) and two end walls (3a, 3b), said inlet (7) being arranged in a first (1a) of said side walls and said outlet (8) being arranged in a second side wall (1b), which is opposite to the first side wall, and wherein a first (9a) support and flow distributing member (9a) is arranged closer to the inlet (7) than a second (9c) support and flow distributing member, and which first support and flow

distributing member comprises a first set (11a) of flow openings which is configured so that the accumulated size of the openings (11a', 11a", 11a"') per area of the support and flow distributing member increases with the distance from the first side wall (1a).

5. Device according to claim 4, wherein the second (9c) support and flow distributing member comprises a second set (11c) of openings, which is configured so that the accumulated size of the openings (11c', 11c", 11c"') per area of the support and flow distributing member increases with the distance from the second side wall (1d).

6. Device according to claim 4 or 5, wherein a third support and flow distributing member (9b) is arranged between the first (9a) and second (9c) support and flow distributing members, which third support and flow distributing member is configured for providing a minimum flow resistance against the first air flow (B), while still inducing turbulence to prevent the formation of laminar flow between the ducts (2).

7. Device according to any of claims 1-6, comprising a plurality of ducts (102), each comprising an end portion (102b'), which extends through the inlet space, between the first support and flow distributing member (109a) and an end wall (103b) of the central chamber (101), which end portion is tapering towards the end wall such that at least one free straight passage (120) for gas is formed between the end portions of the ducts, essentially perpendicular to the longitudinal direction of the end portions.

8. Device according to claim 7, wherein the cross sectional area of the end portions (102b') is essentially constant over the length of the end portion.

9. Device according to claim 8, wherein the cross sectional area of the end portion (102b') is essentially equal to the cross sectional area of the rest of the duct (102).

10. Device according to any of claims 7-9, wherein the end portions (102b') are formed of separate nozzles.

11. Device according to any of claims 1-10, comprising an outlet space for the gas flow B, which outlet space is arranged in the central chamber (1, 101), between the

outlet (8, 108) and a second support and flow distributing member (9b, 109b) and by means for uniform distribution of the gas inside the outlet space for providing a generally parallel and uniform first fluid flow (B) inside the chamber.

12. Device according to any of claim 1 to 11, wherein a wire spiral (2c) is arranged at the inside of the duct wall for inducing turbulence to the second fluid flow (A), inside the duct (2).

13. Device according to any of claims 1 – 12, wherein a wire spiral is arranged at the outside of the duct wall for inducing turbulence to the first fluid flow (B) in the chamber (1) in the proximity of the duct wall.

14. Device according to any of claim 1 – 13, wherein the duct wall material presents irregularities in the duct wall surface for inducing turbulence to the fluid flow (A, B) in proximity to the duct wall, on the inside and/or outside of the duct wall.

15. Stationary arrangement for air treatment comprising a device according to any of claims 1-14 and refrigeration apparatus.

16. Mobile arrangement for air treatment comprising a device according to any of claims 1-14 and refrigeration apparatus.

17. Stationary arrangement for air treatment comprising a device according to any of claims 1-14 and a heat exchanger.

18. Mobile arrangement for air treatment comprising a device according to any of claims 1-14 and heat exchanger.